not appear until there is roughening of the mucosa. The typical changes in the gradual fibrosis of the lung concern the interstitial tissues chiefly and do not cause dulness until atelectasis develops. Suppression of breath sounds and insufficient, irregular expansion of the alveoli are the landmarks of peribronchitic infiltrations as they thread their way through a dry lung. Pain in the terminal areas is often characteristic, and is probably caused by pressure upon the accompanying nerves.

When the return circulation of blood and lymph from the lung is obstructed and the lung is subjected to the backward pressure and danger of edematous infiltrations, the physical signs are those of wet conditions. It is much easier to detect these evident changes, and they are much more pronounced, but they are sometimes mistaken for other conditions. Chronic bronchitis, asthma, and emphysema often cloak tuberculous processes, and acute infections for a time often reveal them; but as the acute hyperemia disappears and the wet sounds dry up we fail to see the connection between existing peribronchitic infiltrations and transient physical signs. We ascribe to grippe, typhoid, measles, and colds the power to initiate tuberculous processes in the lung, but it is possible that they reveal the existence of these processes.

The treatment of tuberculosis of the lungs is influenced by the knowledge that there is an etiological relationship with that of the bronchial glands, because these glands must first be healed before the chancre of perpetual reinfection is removed. This emphasizes the necessity for time. Long after the physical signs in the lungs have become favorable, just as it was long before they were manifested, the sore spots in the bronchial glands remain dangerous and difficult to control. It is possible that the persistency of these sources of infection explains the relapses and the failures to maintain recovery in many cases. The diagnosis and treatment of tuberculosis of the lungs may begin and end in that of the bronchial glands.

A CASE OF DIABETES INSIPIDUS WITH A PECULIAR NECROPSY FINDING IN THE POSTERIOR LOBE OF THE PITUITARY BODY.

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Various changes have been described in the pituitary gland and its neighborhood, at the base of the brain, as having been discovered at postmortem examinations on cases of diabetes insipidus.

J. Camus and G. Roussy[1] are among those who have experimented on the subject. About eighteen dogs were operated on and various areas at the base of the brain in the immediate neighborhood of the pituitary gland were destroyed, and in some animals the pituitary gland itself was destroyed. By these experiments it was proved that polyuria may result even when the lesion is not limited to the pituitary gland. In five cases polyuria resulted, though the experimental puncture did not touch the pituitary gland. The infundibulum seems to be of special importance, and one observation showed that if the infundibulum were preserved it was possible for the pituitary gland itself to be removed without polyuria resulting.

By some authors the "pars intermedia" of the pituitary body has been specially incriminated.[2] Ependymitis, or tumor of the floor of the fourth ventricle, has occasionally been accompanied by diabetes insipidus,[3] and Claude Bernard, as is well known, was able to experimentally produce simple polyuria in animals by puncture of the floor of the fourth ventricle at a point a little above his so-called "glycosuric centre."

The relations between the pituitary gland and diabetes insipidus have recently been dealt with by C. Römer,[4] M. Simmonds,[5] Harvey Cushing,[6] P. Fleurot,[7] D. B. Jewett,[8] Erich Meyer[9] and others; and the allied subject of the effect of metastatic tumors of the pituitary gland has been discussed by Simmonds[10] and S. Erdheim,[11] the latter demonstrating the case of a woman with "Simmonds's syndrome" (the association of mammary carcinoma with polyuria, due to cancerous metastasis in the pituitary gland). Many papers have also been published more or less bearing on the relations of the pituitary gland to imperfect sexual development and infantilism as well as to diabetes insipidus.[12]

[1] Comptes rendus de la Société de biologie, Paris, 1914, lxxvi, 773 and 877; see also Camus and Roussy, Diabète Insipide et Polyurie dite Hypophysaire, Presse médicale, Paris, 1914, xxiii, 517.

[2] Cf. E. Frank, Ueber Beziehungen der Hypophyse zum Diabetes insipidus, Berl. klin. Wchnschr., 1912, xlix, 393.

[3] K. Pichler, *Zentralbl. f. inn. Med., Leipzig, 1903, xxiv, 745.* Pichler gives references to similar cases in the literature. Cf. the old experiments of Claude Bernard on the Experimental Production in Animals of Glycosuria and Simple Polyuria.

[4] Deutsch. med. Wchnschr., 1914, xl, 108; and C. Römer, München. med. Wchnschr., 1913, lx, 2755 (Aerztlicher Verein in Hamburg, November 25, 1913).

[5] München. med. Wchnschr., 1913, lx, 127.

[6] The Pituitary Body and its Disorders, 1912, pp. 17, 267.

[7] Thèse de Doctorat, Paris, 1914.

[8] Med. Record, New York, 1914, lxxxv, 242.

[9] Berl. klin. Wchnschr., 1912, xlix, 1642 (unterelsässicher Aerztev., June 29, 1912).

[10] München. med. Wchnschr., 1914, lxi, 180.

[11] K. k. Gesellschaft der Aertze in Wien, May 29, 1914, Wien. klin. Wchnschr., 1914, xxvii, 867.

[12] See Erich Ebstein, Ueber Eunuchoidismus bei Diabetes insipidus (with many references to previous literature), Mitt. a. d. Greuzgeb. d. Med. u. Chir., 1913, xxv, 441. A. von Strümpell, Med. Gesellsch. zu Leipzig, January 20, 1914; München. med. Wchnschr., 1914, lxi, 504. Pierre Marie and Boutier, Société de Neurologie, Paris, April 3, 1913 (Rev. neurol., Paris, 1913, xxi, 555); F. P. Weber, Brit. Jour. Child. Dis., 1912, ix, 211; T. R. Whipham, Proc. Roy. Soc. Med. (London), Section for Diseases of Children, 1915, viii, 10; Sprinzels, Wien. klin. Wchnschr., 1912, xxv, 937 (K. k. Gesellsch. der Aerzte in Wien, June 7, 1912).

In many cases of diabetes insipidus, symptoms have been observed during life pointing to the presence of lesions at the base of the brain. Clinically a connection between diabetes insipidus and congenital or acquired syphilis has often been suspected; in some cases the belief in such a connection has, I think, received confirmation *ex juvantibus*, that is to say, from satisfactory results of antisyphilitic treatment. In several other cases a connection of some kind with tuberculosis seems to have existed.

Our present case is that of a tuberculous man who suddenly developed diabetes insipidus about two years before his death, which was due to pulmonary and laryngeal tuberculosis. At the necropsy a peculiar change in the posterior lobe of the pituitary body was found.

CASE HISTORY. The patient, F. A., aged thirty-seven years, was admitted to the hospital on March 31, 1915, and died on June 21. He was a thin man, weighing 115 English pounds on admission, and said he had lost nine pounds in weight during the previous nineteen days. His polyuria had apparently commenced suddenly in August, 1913, after a slight operation on his neck, probably the removal of an enlarged lymphatic gland from the right side. This operation did not prevent him making a long railway journey on the same evening, but he commenced to experience great thirst (polydipsia) immediately afterward, and since then he had continuously suffered from polydipsia and polyuria. During the last two months he had had a cough and anorexia, and for one month he had been expectorating mucopurulent sputum.

In the hospital he presented the physical signs of pulmonary and laryngeal tuberculosis, had a hectic type of fever, and steadily lost ground. His mucopurulent sputum swarmed with tubercle bacilli. His urine, which was of about the same specific gravity as ordinary tap-water, pale, clear, and free from albumin and sugar, averaged about 10 liters in the twenty-four hours, sometimes more, sometimes less. On one occasion the daily quantity was as much as 13,250 c.c. His blood serum gave a negative Wassermann reaction for syphilis. His brachial systolic blood-pressure varied between 90 and 115 mm. Hg. His pupils were equal and reacted properly to light and accommodation. Ophthalmoscopic examination showed nothing abnormal. There was no hemianopsia; the visual fields (both for white and for colors) and visual acuity were normal (Dr. C. Markus). Roentgen-ray photographs of the base of the patient's skull (taken by Dr. James Metcalfe) seemed to show that there was no enlargement of the pituitary fossa. During the last days before the patient's death (June 21, 1915) the average amount of urine was less, namely, about 6000 c.c. in the twenty-four hours.

Necropsy and Microscopic Examination. Both lungs were "stuffed with" miliary tubercles; there were no cavities. There was tuberculous laryngitis (macroscopic and microscopic examina-

tion). The heart, pericardium, and aorta showed nothing special. The liver was not enlarged, but looked somewhat fatty. The spleen was slightly enlarged, measuring 12 x 8 x 4 cm., but otherwise by macroscopic and microscopic examination it appeared normal. The kidneys, suprarenal glands, and thyroid glands likewise appeared normal (microscopic as well as macroscopic examination). Nothing special was observed in the pancreas, alimentary canal, or in the

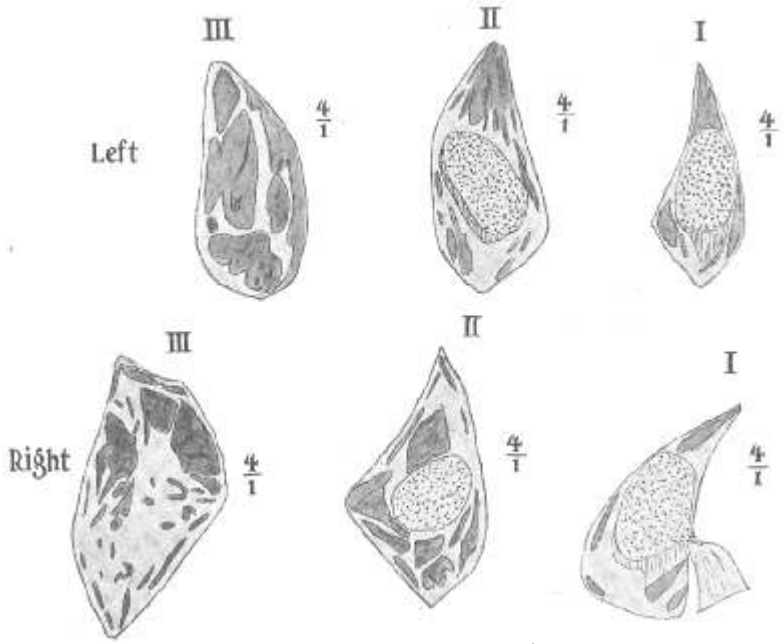

FIG. 1.—A series of six sections of the pituitary body cut parallel to each other, on a vertical-sagittal plane. They are represented diagrammatically four times their natural size. The three in the upper row were cut to the left of the middle line and the three in the lower row were cut to the right of the middle line. The pair marked *I* are those nearest the middle line; the pair marked *III* are those farthest from the middle line; while the pair marked *II* were cut on a plane between *I* and *II*. In these sections the dotted portions represent the anterior lobe (pars glandularis), while the rest represents the posterior lobe (pars nervosa). The two lateral sections (*III*) consist exclusively of posterior lobe substance, while in *I* and *II* the anterior lobe substance is almost completely surrounded by posterior lobe substance. The dark portions in the posterior lobe substance are areas of the yellowish-brownish lipoid cells. (See Figs. 2 and 3.)

testis or epididymis on either side. There were some enlarged lymphatic glands in the neck. The bone marrow of the head and upper part of the shaft of the left humerus was examined macroscopically and looked as if it had not undergone much hemopoietic reaction. The spinal cord was not examined, and in the examination of the brain nothing abnormal was observed excepting with regard to the pituitary body.

The Pituitary Body. At the necropsy the pituitary fossa was found to be not much if at all enlarged, but the posterior lobe of the pituitary body appeared abnormal, and the whole region was removed for further examination. Several sections of the pituitary body were cut; all of them were cut parallel to each other, on a vertical sagittal plane. There could be no doubt whatever that the posterior lobe (pars nervosa) was relatively enlarged in proportion to the anterior lobe (pars glandularis). The posterior lobe almost completely enclosed the anterior lobe, and was of a yellowish-brownish color, the color appearing to spread right into the posterior wall of the pituitary fossa. Fig. 1 represents diagrammatically six of the sections under low magnification (four times the natural size).

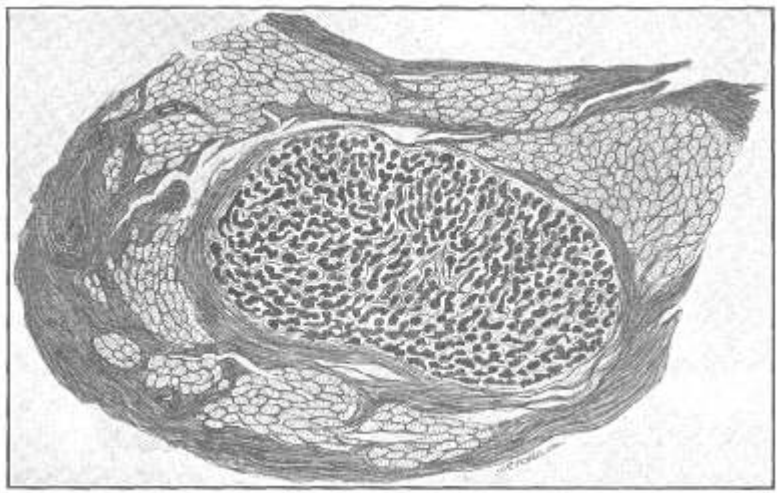

FIG. 2.—A drawing of a section of the pituitary body (magnified 15 times) similar to *II* in the lower row of Fig. 1. The substance of the anterior lobe, which has the normal glandular structure, is almost completely surrounded by posterior lobe substance, which is remarkable for containing large clumps of granular cells.

The three in the upper row were cut to the left of the middle line and the three in the lower row were cut to the right of the middle line. The pair marked *I* are those nearest (to the left and right respectively of) the middle line. The pair marked *III* are those farthest from the middle line, while the pair marked *II* were cut on a plane between *I* and *III*. In these sections the dotted portions represent the anterior lobe (pars glandularis) while the rest represents the posterior lobe (pars nervosa), which in *I* and *II* is seen to almost completely surround the anterior lobe. The two lateral sections (*III*) consist exclusively of posterior lobe substance. The dark portions in the posterior lobe are areas of the yellowish-brownish substance which has given the posterior lobe its decided color.

Fig. 2 is a drawing of a section similar to *II* in the lower row of

Fig. 1, but under considerably higher magnification (magnified 15 times). The substance of the anterior lobe is seen to present the normal glandular structure, but the posterior lobe, which almost completely surrounds it, is remarkable for containing large clumps of granular cells. Part of one of these clumps (from a section stained with Sudan III), magnified 300 times, is represented in Fig. 3, so as to further illustrate the nature of the cells in question. They are rather large cells with small nuclei, which stain deeply with hematoxylin. Their cytoplasm has a granular appearance and many of them take on the Sudan III coloration very well, and show that the granules are really minute droplets of a lipoid substance. In others

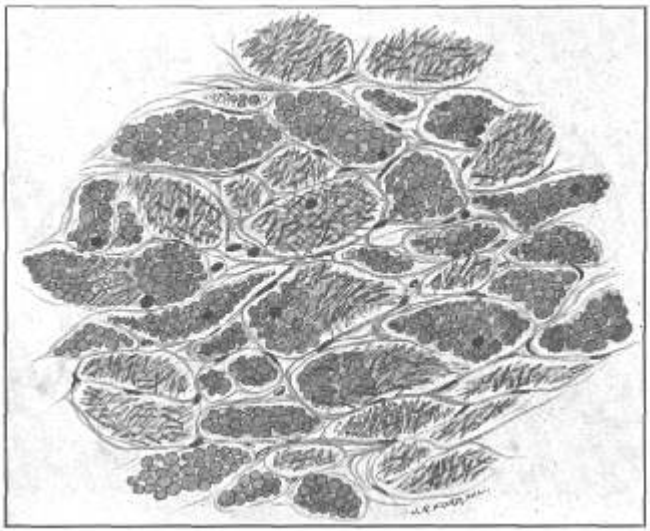

FIG. 3.—A drawing from one of the clumps (see Fig. 2) of cells in the posterior lobe substance of the pituitary body (magnified 300 times). The cytoplasm of some of these cells is full of minute lipoid droplets which have taken on the Sudan III stain very well. The cytoplasm of others of the cells is rich in fatty acid crystals and has taken on the Sudan III stain relatively badly.

of these cells, which stain less well with Sudan III, the cytoplasm appears to be full of minute crystals, doubtless fatty acid crystals of some kind; and probably it was a transformation of the lipoid droplets into fatty acid crystals that caused these cells to take on the Sudan III stain relatively badly.

We think that these cells, which are possibly of neuroglial origin, may be regarded as one kind of "compound granular cells" (Körnchenzellen), the presence of which in considerable numbers forms a feature in various abnormal conditions of the central nervous system. Doubtless the lipoid-containing cells in question gave the posterior lobe substance of the pituitary body in the present case its decided yellowish-brownish pigmentation, which reminded one

of the color of the cortex of suprarenal glands and of some tumors of suprarenal cortical origin.

Many changes in the pituitary body and the base of the brain have (as we pointed out at the commencement of this paper) been described in cases of diabetes insipidus, but we are not aware that an exactly similar change to the one observed in our present case has as yet been recorded. It is impossible to avoid the conclusion that the changes in the pituitary body in the present case were in some way the result of the patient's tuberculosis.

In conclusion, we have to thank Mr. S. G. Shattock, Dr. J. C. G. Ledingham, and Dr. Kinnier Wilson for very kindly helping us in the examination of the sections.

NOTE.—In producing the three figures the original drawings have been considerably reduced, Figs. 2 and 3 by one-quarter and Fig. 1 by two-fifths. The printed descriptions are therefore no longer correct in regard to the question of magnification.